National Institute of Environmental Health Sciences

Increased cause-specific mortality associated with 2003 heat wave in Essen, Germany

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Year: 2008
Journal: Journal of Toxicology and Environmental Health. Part A. 71 (12-Nov): 759-765

Abstract:

During the 2003 heat wave an increase in mortality was observed in several European countries. Evidence suggests that the heat wave effect on mortality varies based upon underlying disease. In this study we examined the effects of the 2003 heat wave on all-cause and cause-specific mortality (neoplasms, cardiovascular and respiratory diseases) in a large west German city. Daily weather data for Essen was obtained from the German meteorological service. Death certificates for all deaths in Essen from 2002 to 2003 were coded according to the World Health Organization (WHO) guidelines. Mean numbers of daily deaths during and after the heat wave were compared with the average mortality in summer months (reference period). Poisson generalized additive models, adjusted for weekday and season, were fitted for overall and cause-specific mortality for the entire study period. During the 2003 heat wave (August 6-12), daily mortality increased by 15% (neoplasms), 30% (cardiovascular), and 61% (respiratory), with a decrease in the week after the heat wave of 17% for neoplasms and a sustained rise for respiratory mortality (77%). Regression analysis showed an association between heat and overall mortality in 2003 and greatest associations for respiratory mortality. Even the comparatively short heat wave in Essen in the year 2003 was associated with a rise in overall and cause-specific mortality. Different mechanisms appear to influence cause-specific mortality, with strongest associations for respiratory mortality. Harvesting might play a role in mortality due to neoplasms.

Source: http://dx.doi.org/10.1080/15287390801985539

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Temperature

Temperature: Extreme Heat

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Germany

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Injury, Respiratory Effect

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content